# Radar Operation Start Check List

1. ONLY IF SWAPPING DISK DATA SETS: Shutdown the acquisition server
2. ONLY IF SWAPPING DISK DATA SETS: Insert the disk data set
3. ONLY IF SWAPPING DISK DATA SETS: Start the acquisition server
4. ONLY IF SWAPPING DISK DATA SETS: Modify the /etc/fstab file to point to the correct data-disk-set
   1. NOTE: Only one data-disk-set may be mounted at a time.
5. ONLY IF SWAPPING DISK DATA SETS: Run umount\_data\_folder.sh
6. ONLY IF SWAPPING DISK DATA SETS: Run mount\_data\_folder.sh. The first time a disk set is used, you may have to change ownership of the filesystem with:
   1. chown -R cresis1:cresis1 /data/
7. Check /data/ for xml files
8. Run “make\_date\_folder.sh YYYYMMDD” if there are XML files to keep in /data/
9. Run reset\_data\_folder.sh
10. Run watch\_data\_folder.sh in a separate terminal.
    1. Monitor the watch\_data\_folder.sh to ensure there is enough space on the /data/digrx\* drives so that the entire data collection for this survey will fit. We do not recommend switching disks in the middle of the survey.
11. Run start\_arena.sh
12. From arenaGUI, select the configuration file you will be running
13. Turn on the arena digital system
14. Wait until the network connection is active (usually 10-30 seconds depending on the network switch)
15. From arenaGUI, set the system to “open”.
    1. This establishes a network connection with each arena module. If any module fails to go to open state, debug the network connection and power to the arena modules.
    2. Once the network connection is good, we are sure that the arena modules are in a stable state and it will be safe to turn on the power amplifier.
16. From arenaGUI, set the system to “close”
17. Turn on the power amplifier.
18. From arenaDisplay, load the appropriate arenaDisplay config XML for your radar settings in /arena/arena/configs/
19. From arenaGUI, set the system to “run”
20. During collection monitor:
    1. PPS counter
    2. Alignment average for each DAC and each ADC module
    3. File space using watch\_data\_folder.sh
    4. Noise power at end of record for each data stream in arenaDisplay should be the same each day
    5. Signal power at peaks for each data stream in arenaDisplay should be similar in magnitude to each other

# Radar Operation Stop Check List

1. From arenaGUI, set the system to “stopped”
2. Close the three arena software programs
3. Prepare the data for switching disk drive data sets, processing, and archiving
   1. “make\_date\_folder.sh 20181014”

# Processing and Archiving Check List

1. ONLY IF SWAPPING DISK DATA SETS: Shutdown the acquisition server
2. ONLY IF SWAPPING DISK DATA SETS: Remove data-disk-set
3. ONLY IF SWAPPING DISK DATA SETS: Shutdown the archive server
4. ONLY IF SWAPPING DISK DATA SETS: Insert data-disk-set
5. ONLY IF SWAPPING DISK DATA SETS: Restart archive system
6. ONLY IF SWAPPING DISK DATA SETS: Modify /etc/fstab file to point to the correct data-disk-set
7. Run umount\_data\_folder.sh
   1. This script must be run any time the /etc/fstab file is changed. It unmounts /data/digrx\*
8. Run mount\_data\_folder.sh
   1. This script mounts the data-disk-set pointed to by /etc/fstab which has the radar data that you want to process and/or archive. It mounts /data/digrx\*
9. Create or append to notes file in /scratch/metadata/SEASON\_NAME/notes.txt information about which data-disk-set was used, the date of the collection and a general description about the dataset.
10. SWAP ARCHIVE DRIVES IF NECESSARY: If the archive drives need to be switched because they failed or do not have sufficient space:
    1. Run umount\_archive.sh
    2. Power down server unless using Ethernet, USB or ESATA archives
    3. Disconnect old drives, connect new drives
    4. Power server on if needed
    5. Modify arena bash settings (e.g. arena\_bash\_settings\_2019\_Antarctica\_Ground.sh) to point to the new archives:  
       archive\_mounts[0]="/mnt/archive1"  
       archive\_mounts[1]="/mnt/archive2"
11. Run “archive\_data\_folder.sh 20181014”
    1. This script will mount the archive drives (e.g. NAS or hard disk RAID) and copy the data from the data-disk-set, /data/digrx\*, to the archive, /mnt/archive\*. The script may be interrupted and restarted since it uses the “rsync” command to copy.
12. Follow steps in “Radar Quick Look Processing Steps\_v2.pdf”. These can be done while archive\_data\_folder.sh is running.
    1. The default is to process data from the data-disk-set with the data (/data/digrx\*) since the data-disk-set usually uses SSDs. It is possible to process from the archive disks (/mnt/archive\*), but the archive is usually on a NAS or spinning hard disks and can be much slower.
13. FOR OLD UDP SYSTEMS: Delete scratch data when done processing by running “delete\_scratch\_folder.sh 20181014”
    1. This is important since it ensures there is space on /scratch for processing. Note that the /scratch is NOT where the raw data are stored although in some configurations the scratch folder is located on the data drives.
14. ONLY IF RUNNING OUT OF SPACE OF DATA DISK: If the data-disk-sets are running out of space, you can delete date folders on the data-disk-sets, /data/digrx\*, after archive\_data\_folder.sh finishes and you verify the files are present at /mnt/archive\*. Run “delete\_date\_folder.sh 20181014” to do this.
15. ONLY IF SWAPPING DISK DATA SETS: Shutdown the archive server
16. ONLY IF SWAPPING DISK DATA SETS: Remove data-disk-set
    1. The data-disk-set is now ready to be used in the acquisition server again.

# Data-disk-set Swap /etc/fstab

For example, to switch from data-disk-set 3 to data-disk-set 4, run “sudo gedit /etc/fstab” and change the following lines in the file as shown below. The idea is to comment out with “#” the data-disk-sets that are not used and uncomment (remove “#”) the single data-disk-set that is being used. Two data-disk-sets cannot be enabled at the same time since the drives will mount on top of each other in this case. **Make sure to save and close the /etc/fstab file.**

# Data Set 3 (BLUE)

#/dev/disk/by-uuid/b158f361-2f6b-4090-9240-e527d2d934f2 /data/digrx0 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/d65dc045-d80e-402e-8854-36ae9c3d442e /data/digrx1 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/8825f794-54b0-47e4-9ad0-0896cd3b1406 /data/digrx2 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/955574a5-193b-44f5-8300-7cbbda509691 /data/digrx3 ext4 defaults,auto,nofail,errors=remount-ro 0 1

# Data Set 4 (YELLOW)

/dev/disk/by-uuid/733ab14e-c4df-48f3-ad41-d58fdc51ba5d /data/digrx0 ext4 defaults,auto,nofail,errors=remount-ro 0 1

/dev/disk/by-uuid/f9d760da-65c1-4789-bdf7-2a12bf5ec360 /data/digrx1 ext4 defaults,auto,nofail,errors=remount-ro 0 1

/dev/disk/by-uuid/f43640f1-7052-4756-a583-7612d62f3172 /data/digrx2 ext4 defaults,auto,nofail,errors=remount-ro 0 1

/dev/disk/by-uuid/7d2cfd0c-b923-4e29-b09d-915266c8f0e2 /data/digrx3 ext4 defaults,auto,nofail,errors=remount-ro 0 1

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/dev/disk/by-uuid/d65dc045-d80e-402e-8854-36ae9c3d442e /data/digrx1 ext4 defaults,auto,nofail,errors=remount-ro 0 1

/dev/disk/by-uuid/8825f794-54b0-47e4-9ad0-0896cd3b1406 /data/digrx2 ext4 defaults,auto,nofail,errors=remount-ro 0 1

/dev/disk/by-uuid/955574a5-193b-44f5-8300-7cbbda509691 /data/digrx3 ext4 defaults,auto,nofail,errors=remount-ro 0 1

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#/dev/disk/by-uuid/733ab14e-c4df-48f3-ad41-d58fdc51ba5d /data/digrx0 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/f9d760da-65c1-4789-bdf7-2a12bf5ec360 /data/digrx1 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/f43640f1-7052-4756-a583-7612d62f3172 /data/digrx2 ext4 defaults,auto,nofail,errors=remount-ro 0 1

#/dev/disk/by-uuid/7d2cfd0c-b923-4e29-b09d-915266c8f0e2 /data/digrx3 ext4 defaults,auto,nofail,errors=remount-ro 0 1

# Additional Tools

Tools located in /arena/arena/scripts

archive\_date\_folder.sh YYYYMMDD

Used to copy data from /data/YYYYMMDD to the archive directories

arena\_bash\_settings\_2018\_Antarctica\_Ground.sh

arena\_bash\_settings\_2018\_Antarctica\_Ground\_secondary.sh

arena\_bash\_settings\_2018\_Antarctica\_TObas.sh

arena\_bash\_settings\_2018\_Antarctica\_TObas\_secondary.sh

arena\_bash\_settings\_2019\_Antarctica\_Ground.sh

arena\_bash\_settings\_PASIN.sh

Various bash settings files for different systems

delete\_config.sh ARCHIVE\_DIRECTORY CONFIG\_FILE

Delete specific data segments

delete\_date\_folder.sh YYYYMMDD

Deletes a date folder from /data

delete\_scratch\_folder.sh YYYYMMDD

Deletes a scratch date folder

make\_date\_folder.sh YYYYMMDD

Restructures data in preparation for data-disk-set switches, processing, and archiving

mount\_archive.sh

Mounts the /mnt/archive drives

mount\_data\_folder.sh

Mounts the data-disk-set on /data

reset\_data\_folder.sh

Removes all unmoved files (i.e. make\_data\_folder has not been run on the data)

Create directories and mount /data drives

rsync\_config.sh

Example of how to rsync specific data files rather than all files

start\_arena.sh

Starts the arenaDAQ, arenaDisplay, arenaGUI software

umount\_archive.sh

Unmounts the /mnt/archive drives

umount\_data\_folder.sh

Unmounts the data-disk-set from /data

vnc.sh

Starts the VNC server

watch\_data\_folder.sh

Watches the contents and space available on the data-disk-set, /data folder, during data collection

# Git Repositories

git clone https://cresis1@git.cresis.ku.edu/dangermo/arena.git

/arena/arena

git clone https://cresis1@git.cresis.ku.edu/dangermo/cresis-toolbox.git

git branch -b paden remotes/origin/paden

/scratch/scripts/cresis-toolbox

git clone https://cresis1@git.cresis.ku.edu/dangermo/ct\_params.git

/scratch/scripts/ct\_params

# Recompile Arena GUI Software

Remake software in this order:

cd /arena/arena/arenaUserApps\_v5/common

make

cd /arena/arena/arenaUserApps\_v5/arenaGUI

make

cd /arena/arena/arenaUserApps\_v5/arenaDisplay

make

cd /arena/arena/arenaUserApps\_v5/arenaDAQ

make

# Dome Fuji Ground Based RDS Configuration Files

* survey\_170-230MHz\_100ft\_10us\_4500mthick.xml
  + This is the default configuration file that is loaded. The default can be changed in the script that the $ARENA\_SETTINGS environment variable points to. The $ARENA\_SETTINGS environment variable is set in /home/cresis1/.bashrc. The CONFIG\_XML
* cal\_val/survey\_170-230MHz\_0usDelay\_10us\_LOOPBACK\_TRANTENNA1.xml
  + Loopback test on transmit antenna 1
* cal\_val/survey\_170-230MHz\_0usDelay\_10us\_LOOPBACK\_TRANTENNA2.xml
  + Loopback test on transmit antenna 2
* cal\_val/survey\_170-230MHz\_0usDelay\_10us\_LOOPBACK\_TRANTENNA3.xml
  + Loopback test on transmit antenna 3
* cal\_val/survey\_170-230MHz\_0usDelay\_10us\_LOOPBACK\_TRANTENNA4.xml
  + Loopback test on transmit antenna 4
* cal\_val/survey\_170-230MHz\_100ft\_10us\_NOISE.xml
  + Noise test (no transmission)

# Dome Fuji Ground Based RDS Lab Test Steps

1. Connect the loopback setup to transmit antenna 1.
2. Load the noise configuration
3. Collect 2 or more data files
4. Process
5. Check expected results
6. Load the loopback TRANTENNA1 configuration
7. Collect 2 or more data files
8. Process
9. Check expected results

# BAS TO RDS Configuration Files

# BAS TO RDS Lab Test Steps

# Hercules Dome Ground Based Configuration Files

# Hercules Dome Ground Based Lab Test Steps